

AMERICAN VETERINARY REVIEW,

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ORIGINAL ARTICLES.

REPORT ON THE RECENT CATTLE DISEASE IN KANSAS.

BY PROF. JAMES LAW, of Cornell University.

(Continued from page 297.)

NATURE OF ERGOT.

Ergot was at one time supposed to be the seed altered by disease, but the researches of De Candolle, Queckett, and more recently of Tulasne demonstrated that it is a distinct product, a fungus, which fixes itself on the pistil of the grass and destroys the seed while taking its place. The fungus is known as the *Claviceps purpurea*, and Tulasne has traced it through the three successive stages of its life history.

The first stage commences with the development of the pistil, as a parasitic growth on the outer membrane of the ovary of the grass, which it completely replaces, growing upon the inner membrane and obliterating the cavity of the ovary. This product—the sphaecelia of Tulasne—is an oblong fungous mass, soft, tender, almost homogeneous, and covered with sinuous furrows. The external surface, and that of irregular cavities hollowed out in its interior, are covered by linear parallel cells, from which grow out oval cells—conidia, the spermatie of Tulasne—from five to seven thousandths of a millimeter in length, which spread themselves on the investing glumes. A mouldy product seen on the summit

of the pistil is really an independent fungus. At an advanced stage of the development of the sphacelia an adhesive fluid exudes from its surface, carrying with it many of the conidia, and concretes in the form of oily-looking dark spots.

Soon the second stage is reached by the development of the ergot at the base of the sphacelia and at first invested by it. It is compact violet-black outside and white within, and grows rapidly in all directions, extending out of the glumes, carrying on its summit the withered remnant of the sphacelia, and sometimes, also, some remaining traces of the aborted ovary, including its terminal hairs. The fully-developed ergot, or sclerotium, which projects from the glumes for a greater or less distance, according to the natural size of the seeds in the plant attacked, is familiar, by its black or violet spur-like aspect, slightly curved, marked with longitudinal furrows, and often presenting at intervals whitish patches, where the originally investing sphacelia has been removed. In one case watched by Tulasne it required a month for the ergot to pass through these two stages to its full development. In anatomical structure the ergot bears no resemblance to the seed, but is essentially the sclerotic mycelium of a fungus. Its parenchyma is hard, dry, brittle, and made up at all points of minute utricles, with thick walls containing a comparatively transparent oil, very slightly colored by iodine. No starch is usually found, though mentioned in the analysis of Legrip given below.

The third and last stage consists in the development on the surface of the ergot of minute bodies like toadstools. On soil in which the ergot has been dropped these bodies grow up on stems one-quarter to one-half inch in height, with a globular head one-twelfth inch in diameter, the whole growing out of the ergot as a potato plant grows out of the tuber. The cavities in the globular head are filled with sporidia, which, coming in contact with the soft ovary of the grass at the earliest stage of its development, grows into the sphacelia and ergot. If these sporidia are washed into the soil where rye is planted they determine the development of ergot in the coming crop, and it is supposed by many that the spores are taken up by the rootlets and carried to the flowers in the juice of the plant. The fungus developed in the soil from the implanted ergot belongs to the genus *Sparia*.

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Analysis of ergot. Ledrip.

Yellow fixed oil.....	34.50
Starch.....	2.75
Albumen.....	1.00
Inuline.....	2.25
Gum.....	2.50
Uncrystallizable sugar.....	1.25
Brown resin.....	2.75
Fungine.....	3.50
Vegeto-animal matter.....	3.50
Osmazone.....	0.75
Fatty acid.....	0.50
Lignine.....	24.50
Coloring matter.....	0.50
Fungate of potassium.....	2.25
Chloride of sodium.....	0.50
Sulphates of calcium and magnesium.....	0.50
Subphosphate of calcium.....	1.25
Oxide of iron.....	0.25
Silica.....	0.15
An odorous principle, not isolated.	
Water.....	2.50
Loss.....	2.35
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Various organic constituents have been separated and advanced as the active principle of ergot. Wiggers attributes its action to ergotine, and Dr. Wright to the fixed oil, but manifestly without sufficient grounds. Winckler isolated secale as a principle identical with propylamia, the odorous ingredient in herring pickles, but if active at all this is only so in a secondary sense. Wenzell, of Wisconsin (confirmed by Hermann, of Germany), isolated the alkaloid *ecbolina* which causes cerebral disturbance and lowering of the pulse. Wenzell found *ergotina* possessed a similar but much less potent action. Dr. Levi sustains this view of *ecbolina* and *ergotina* as affecting the brain and heart, but denies that they have any action whatever on the gravid uterus. This he found to be caused by the phosphoric acid present in the ergot.

MODE OF ACTION OF ERGOT.

The most prominent physiological action of ergot, whether taken internally or applied locally, is its power of causing contraction of involuntary muscle. This contraction of the muscles in

the walls of the capillary blood-vessels explains readily the stoppage of circulation in, and death of the parts the farthest removed from the heart and where the circulation is weakest; in other words, the occurrence of dry gangrene. In the same way is explained the power of ergot to arrest hæmorrhages and mucous discharges, whether it is applied locally or taken internally. Even abortions are sought to be explained on the ground of its causing contractions of the involuntary muscular fibers in the walls of the womb, and the nervous disorder and depression of the heart's action by the diminished circulation through the capillary vessels of the brain and heart respectively. There is reason to suppose, however, that, as in the case of various other fungi, the principles of ergot act directly on the nervous substance, inducing the various phenomena of nervous disorder, and indirectly contributing to the derangement of the heart and stomach. If we accept the results reached by Dr. Levi, we must acknowledge the action on the brain and womb to be respectively primary and distinct, seeing they are produced by the two ingredients, ecbolina and phosphoric acid.

The whole subject of the different forms of ergot and smut, and of other fungi, in their action on the animal system, is yet far from being fully understood, and offers a very promising field to the patient investigator.

NATURE OF SMUT OF CORN (MAIZE). *USTILAGO MÄIDIS*.

This fungus develops in the bracts and leaves that surround the female flower, in the neighboring leaves of the stem, and on the spike of the male flower. Under its growth the coverings of the pistil become greatly enlarged, abnormally broad, and flattened with longitudinal grooves, or narrow, thick, and long, with prominent, rounded, longitudinal ridges. The resulting enlargement varies from the size of a hazel-nut to that of the closed fist. The ovary also is invaded and hypertrophied, often to the size of a walnut, but always smaller than its diseased investments, and it may entirely disappear. The remnants of the ovule are usually found in the interior of the diseased mass. Its diseased integuments are at first white, later pink, and finally brownish or smoky. When the ear is affected the diseased flowers or seeds

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are almost always grouped in the same circular zone and near the summit of the ear, while some have merely aborted, and the great majority of the flowers remain sound.

The fungous excrescences, when recent and still filled with juice, are made up of a structure of large cells with frequent interspaces and traversed by a few fibro-vascular bundles. The large cells and interspaces are alike filled with the substance of the fungus, a colorless, jelly-like material, only slightly stained with iodine. Here and there in this material are the round or oval forming spores, which acquire a deep brown or yellow color on the addition of iodine, and around which the gelatinous mass comes to arrange itself in polyhedral masses. At a more advanced stage the center of a diseased mass shows a network of black lines formed by the confluence of the smutty spaces, while around the margin there remains the original colorless structure gorged with juice. When mature the diseased mass is filled with black spores, each covered with spikes like a chestnut burr.

USTILAGO CARBO. SMUT OF BARLEY AND OATS.

This also attacks wheat but to a less extent. It grows on the substance of the glumes and spike, causing entire abortion of the flowers on wheat and oats, but leaving traces of them in barley. Finally there is left merely a ball containing the black spores, which in this species are perfectly round and smooth.

TILLETIA CARIES—UREDO CARIES—USTILAGO CARIES— SMUT OF WHEAT.

This fungus grows in the interior of the ovary only of wheat and some other grains, and when mature has not materially altered the size of the seed, but has imparted to it a brownish color, and three additional longitudinal grooves, one on the back and one on each side. When mature, it has a very thin envelope inclosing in a delicate fibrous net-work a mass of black spores, each with a finely reticulated surface.

The conditions that favor the production of these are in the main the same—the presence of the spores, a damp soil, a shady locality (the presence of trees and woods), the absence of free circulation of air, a moist air, a clouded sky, hot weather,

frequent thunder-storms, heavy rainfalls, and extreme changes of temperature, are especially noteworthy. Newly broken-up land, rich in decomposing vegetable matter, and land that has been overmanured favor their growth. Dr. Vœleker attaches great importance to an excess of nitrogenous matter in the soil, and Dr. J. B. Lawes to a relative deficiency of mineral matter, both of which conditions favor a growth deficient in stamina, even if luxuriant.

TREATMENT OF ERGOTISM.

This can only be satisfactory in the mildest cases and in the early stages. When warmth, sensibility, and circulation have left the extremities, recovery can only occur after they have separated. If circulation and nutrition have been permanently arrested in a circumscribed part of the brain or spinal cord, it may still be possible to preserve life, but this is liable to be incurable paralysis.

In mild and recent cases the treatment may be summed up in this: Make a thorough change from the ergoted or smutty fodder to a more wholesome diet, and preferably to one largely made up of succulent vegetables in a sound condition (turnips, beets, carrots, pumpkins, potatoes, apples, grass, ensilage, &c.); remove by purgatives any remaining ergot in the stomach and bowels; solicit by the use of abundance of diluents (daily liberal salting and free access to water at all times) and by diuretics (sweet spirits of niter, digitalis, or iodide or nitrate of potassa) the elimination from the blood and tissues of the active principles of the ergot; rouse by stimulants and tonics (ammonia, valerian, capsicum, angelica, musk or alcohol and gentian) the failing vital and circulating power; and oppose the contraction of the capillary vessels by such antagonistic agents as nitrite of amyle, chloral hydrate, chloroform, or opium. Locally, cleansing of the affected feet and the application of poultices containing a little camphor would be indicated. In cases where there is as yet no indication of gangrene, but merely a raw sore between the hoofs, a local stimulant like wood tar, with or without a few drops of sulphuric acid, will greatly favor a healthy reaction. Similarly, if the disease is confined to the sole of the foot without leading to shedding of the hoof, but merely to turning up of the toe or to lame-

ness, with creaking of the detached horn, this horn may be pared off, its edges thinned in a slopping manner on to the adjacent healthy horn, and the exposed secreting surface may be dressed with the tar and acid mixture referred to above. Sores in the mouth may be treated with borax or a solution of one part of carbolic acid in fifty parts water.

PREVENTION OF ERGOTISM.

The first object should be the avoidance of ergoted hay or smutty corn or cornstalks. Above all is this important in the case of cattle, which exercise so little care in the rejection of the faulty fodder. Experience shows that sheep and pigs will reject what will be greedily devoured by cattle; hence, the same hay which proves injurious to the latter may often be safely fed to the former.

Meadows in which ergot is abundant should be cut before any of the grasses have run to seed. The ergot only develops in the ovary or pistil, and therefore it cannot even start its growth until the grasses come into flower. Grass or hay that has been cut at or before the stage of flowering is safe to feed.

In the same manner pastures subject to ergot may be rendered safe by keeping them always eaten down so that none of the grasses can run to seed. If during a growing season any part of the field rejected by the stock threatens to run to seed, it should be at once cut down with a mower, before the seed has had time to form.

The most dangerous time appears to be the period between the formation of the soft, milky seed and its full ripening. Fully ripened grasses, therefore, with an equal amount of ergot, are somewhat less deleterious than that which has run to seed but is as yet immature. Unfortunately, this is usually more than counterbalanced by the extra growth and abundance of the ergot in grasses that have ripened fully before they were cut.

Where ergoted hay must be eaten, its evil effects may be largely obviated by feeding it with an abundance of succulent vegetables, such as turnips, carrots, beets, potatoes, pumpkins, apples, and the like, the excess of water as well as the relaxing constituents of which serving to counteract its effects. Thus

although ergot is common in much of the hay in the west of England, yet with the abundance of turnips fed in winter dry gangrene is unknown. The same is true of Belgium and other parts of the European continent where agriculture is advanced, and ergotism, which was formerly widely spread, is now confined to such backward districts as Sologne, where the marshy, unimproved soil maintains also the sister scourge of anthrax. In Lower Canada, too, where roots are largely grown, dry gangrene is much less common than in Ontario and our Northern States. In man, it is testified by Eckmann and Hojer, of Stockholm, that the addition of potatoes to a diet into which ergoted flour largely entered at once abated the evil effects of the latter. In the Alps of Bellona, too, ergotism (pellagra) disappeared as a disease of man on the introduction of potatoes as a staple article of diet. (Vallenrosea della Fallcadina. Balardini.)

The value of an abundant ingestion of water as a palliative or preventive cannot well be overestimated. Much of the good effects of the succulent vegetables is due to their aqueous constituents, and ergotism rarely attains to a serious prevalence until the water supply is restricted by freezing, or the consumption of water by cold weather. Hence the preparation of the ergoted hay in a wet condition (steamed, scalded, boiled, fermented) is to a certain extent palliative of its evil effects. For the same reason an abundant daily supply of salt, which will tempt the animal to drank freely, will prove in some measure protective.

Making ensilage of the grass in place of curing it dry has the double advantage of securing the product before it has run to seed, or ergot, and of feeding it in a moist condition, counteracting the effect of any ergot that may be present.

In the case of well-ripened hay the danger may be largely got rid of by passing it through a threshing machine. The seed and ergot having been both removed, the hay may be safely fed to stock. Such seed is unfit to sow, but may be fed in small quantity if boiled, or after boiling will make good manure.

To avoid the production of smut from spores sown with grain it is customary in Scotland to "pickle" the seed before putting it in the ground. This is done by sprinkling it freely with a

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saturated solution of sulphate of copper, while it is being turned over with shovels, and afterward drying it by sifting into it freshly burned quicklime as it is being turned over a second time.

When the soil has become thoroughly impregnated with ergot or smut, the only course to be pursued is to tear it up with the plow and raise a succession of root crops, potatoes, buckwheat, &c., which do not harbor the fungus, and which require a great deal of cultivation and exposure of soil to the air.

Land that is habitually wet will be benefited by thorough drainage; that which is shaded by trees will be improved by removing them and letting in the air and sunshine, while worn-out soils may have an application of fertilizers. In this way the conditions favoring the growth of ergot may be in a measure removed and the more vigorous plants will be better able to maintain a healthy growth. The evil, however, doubtless comes from a few days with cloudy, damp weather occurring at the period of flowering of the grass, and where the spore of the ergot is present, the best conditions of life which careful culture can secure for the plant will fail to secure immunity from the scourge, and the watchful stock-owner must fall back upon such measures of early mowing, etc., as will best secure the animals against the evil. It should be added that the more vigorous the plant and the more quickly it passes through the susceptible stage of its growth the less opportunity has the fungus for taking possession of the flower at the critical moment.

Finally; a liberal dietary and a vigorous animal system will guard somewhat against ergotism. The more liberal and varied the diet the more will the animal be disposed to reject such food as is not specially appetizing, thus diminishing the ingestion of the ergot and increasing that of the more wholesome diet which will counterbalance and counteract it. Similarly the animal system which is plethoric or rather bordering on plethora has a more active nutrition and less readily submits to any noxious contraction of its overfilled vessels under the action of cold, ergot, or any chemical astringent.

SUGGESTIONS FOR INVESTIGATION.

So much yet remains to be learned of the action of fungi on

the animal economy, whether through their chemical products, as in the case of ergot and smut, or through the propagation in the animal fluids of the micrococcus forms of the lower species, that it may be appropriate to throw out a few hints as to the valuable results to be expected from investigations in this field, and as to some of the directions which such investigation should take. This investigation will necessarily require considerable outlay, and the most careful supervision to guard against fallacies, but it may one day be undertaken by National or State Government, by an institution, or by some wealthy and patriotic citizen.

1st. Ascertain the action of ergot on the animal economy :

a. As applied to a raw surface.

b. As given internally.

c. In its early stage. { *a.* As forming sphacelia.
 b. As developed sphacelia.

d. In ergot or sclerotium form. { *a.* Before it has grown out
 of the glume. *b.* When
 fully matured.

e. In fungus or mushroom form.

f. As administered in large doses in each of these conditions.

g. As given continuously in small doses in each of these conditions.

h. As given to plethoric animals.

i. As given to animals in poor condition.

j. As given with free access to water.

k. As given with very sparing supply of water.

l. As given with shelter in warm building.

m. As given to animals without shelter.

n. As given during continuous frosts.

o. As given in cool but thawing weather.

p. As given in hot summer weather.

2d. Ascertain the difference of its action as grown on the sea-board, and in the center of the continent ; in the open field, and in the shade ; in valleys and basins, and on elevated table-lands and hills ; in a moist and a dry atmosphere ; in cloudy and in cloudless seasons ; in cold and warm seasons ; and with many or few thunder-storms.

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3d. Ascertain the difference of its action as grown in the various gramineæ subject to its attacks.

4th. In cases where the ergot is largely present and physiologically active, ascertain if any inimical qualities attach to the stems (hay, straw) apart from the diseased seeds and ergot.

5th. Ascertain the effect of soils on its growth and activity:

a. Damp and dry.

b. Porous and impervious.

c. With open and impervious subsoil.

d. Deep and shallow.

e. Rich in organic matter, and deficient.

f. Rich in nitrogen, and deficient.

g. Rich in the mineral constituents of the grasses, and deficient.

h. If long in cultivation; heavily manured and the opposite.

i. If newly broken; after timber and after prairie.

6th. Ascertain how the activity is affected by the different modes of curing the fodder.

7th. Make similar experimental investigations in the case of each of the other fungi that attack cultivated fodders.

8th. In the case of the lower species of fungi, the effect of the interstitial, and intravenous injection of the micrococci should be determined.

These inquiries are not suggested that they may be at once undertaken by the National Government, which has much more important and more urgent duties in the *stamping out* of exotic and other animal plagues which are not limited, like ergotism, to particular districts, but threaten the whole nation indiscriminately. They may, however, be taken up by others; or at some future time, when the true plagues have been effectually dealt with, the general interests of agriculture and sanitation may be consulted by some such investigation into the pathogenic bearings of the parasitic fungi of grains and fodders.

CROTALISM.

A NEW DISEASE AMONG HORSES—RESULTS OF INVESTIGATION
MADE AT THE VETERINARY COLLEGE AT AMES.

BY PROF. M. STALKER, M.D., V.S.

AMES, Sept. 24th.—*Special to the State Register.*—Some two months since repeated calls began to be made on my office through letters from various localities between Council Bluffs and Sioux City, for information concerning a highly fatal form of disease prevailing among the horses. These letters came from towns in Iowa, Nebraska and Dakota, but in every instance from locations in the Missouri valley. I went out in answer to these calls and soon learned that the situation was one of sufficient gravity to justify alarm. After visiting a number of towns along the line of the Sioux City & Pacific Railway, and making long excursions into the country, I gathered sufficient history to justify the estimate of fatal cases at several hundred.

The disease had been known in this region for three or four years, but had not until the present summer prevailed to such an extent as to attract general public attention. But now the loss in horse stock on some farms was not to be counted by hundreds, but by thousands of dollars. The disease proved to be one that had not hitherto come within the range of my experience nor had I any information of anything exactly identical with it. I spent several days among the farmers on the Iowa side of the Missouri river, taking careful notes of the symptoms, and gathering the history of the progress of the disease. On some farms I found almost all the horses affected, and on others but a few individuals. Deaths were an almost daily occurrence, and the farmer who owned a large stock of horses did not know to-day whether he would have teams for his farm work a week later. The disease in most cases is very slow in its progress, but proving almost uniformly fatal after a number of weeks or months. There is a general decline of bodily vigor throughout this period, and the only abnormal symptom in many cases is that of marked emaciation and consequent weakness. Horses that have been kept at pasture through the summer, without work, and where the

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grass grew in the greatest abundance, were so thin in flesh that they walked with the greatest difficulty. A critical examination of many of these patients revealed nothing more than the conditions resulting from starvation. This was not uniformly the case. In a number of instances there was marked coma or stupor, the animal often falling asleep while eating. In some instances the animals would remain standing for a whole week, sleeping much of the time with head resting against some object. In a few instances the animals were placed at my disposal, and assisted by Dr. Fairchild and Dr. Milnes I made post mortem examinations of five subjects with the most perfect uniformity as to the lesions presented. In every instance there was marked hæmorrhagic effusions into the fourth ventricle, the liver and spleen were abnormally dense, the walls of the intestines were almost destitute of blood, and the stomach enormously distended with undigested food. The stomach with its contents in some instances, weighed as much as seventy pounds. These post mortem conditions, together with the clinical symptoms, led me to believe the animals were obtaining some poisonous principle with their food. The symptoms in some cases bore such a resemblance to those produced by eating *Astragalus Mollississimus*, or loco plant of the Western plains, as to direct my investigations to that family of plants. A careful examination of the meadow and pasture lands was not rewarded by the discovery of a single loco plant.

It took but little investigation, however, to find a closely related plant growing in great abundance, both in the meadows and pasture. This was the *Crotalaria Sagettalis*, or rattle box. This is also known as the wild pea, and is accounted by many farmers as the best of forage plants. Knowing the bad reputation of some of its near relatives I determined to make some experimental tests with the plant. I employed a boy to collect about thirty pounds of the green plants, which I brought with me on my return to the college. I procured a strong young horse, affected with incurable catarrh, and attempted to induce him to eat the plant. This he persistently refused to do, though I sharpened his appetite by a protracted fast. It is a matter of common observation that animals eat it with the greatest relish in localities where it grows. Fail-

- ing to induce the animal to take the plant voluntarily I prepared a strong infusion, and by means of the stomach pump gave the preparation obtained from about ten pounds of the plant. In twenty minutes stupor began to ensue, the eyes were closed, the head was rested against the side of the box, the breathing became stertorous, and all the symptoms developed that were to be seen in the patients previously examined. At the end of six hours the stupor began to disappear, the eye began to regain its brightness and in another hour the horse began to eat. The following day, when he had apparently recovered from its effects, he was given half the quantity of the drug as on the previous day. In this instance the symptoms were developed much more rapidly, the animal becoming unconscious in a short time and died in an hour and a half. The post mortem revealed the same condition of the brain as in the case examined in the western part of the State. I now resolved to make a second experiment, in which the animal should receive a small quantity for a number of days in succession. Having procured another subject for experimentation and a bushel of the mature fruit, or pods of the plant, I commenced on Sept. 5th to give daily the infusion obtained from about one quart of the pods. On the fifth day of the experiment the characteristic stupor came on. The animal rested its head against the box and slept while standing. The symptoms grew more marked till the thirteenth day of the experiment, when the animal died. The post mortem showed the same as in the other cases. These experiments leave no doubt in my mind that the trouble along the Missouri river is occasioned by the animals feeding on this little plant. It is from eight inches to a foot in height, with branching stems bearing yellow flowers in July and developing large pods resembling the pea, but containing a number of black, hard seeds. It grows on sandy bottom land, and is very abundant in the meadows and pastures in portions of the Missouri bottom. It is seldom seen among the tame meadow grass in any considerable amount. It thrives best among the wild grasses. Animals, doubtless, eat it much more than formerly, when the wild pasturage was better than at present. Cattle sometimes, though not often, suffer in the same way as horses.

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The first question the farmer is likely to ask, is: "What shall we do?" You cannot rely on drugs to cure the disease. You must prevent its appearance. Feed wild hay free from the poisonous plant, tame hay, corn fodder, sheaf oats, straw, anything but the wild pea. Plow up the land and put it in tame grass. The wild rye, which is taking much of the bottom land, is aggravating the disorder brought on by the rattle box. By the proper cultivation you will get rid of both at once. Animals placed on good green pasture, or supplied with other nutritive food, free from the poison, will doubtless make slow recovery. Two ounces of epsom salts, with two drachms of sulphate of iron and one drachm of nux vomica daily will tend to restore the tone of the system and promote digestion.

Prof. Bessy, in the forthcoming college bulletin, which will be published about the first of November, will give a full description of this plant, together with accurate plates.

ARE FURTHER EXPERIMENTS NECESSARY?

DR. SALMON REPLIES TO THE CHICAGO CATTLE BROKERS.

Elmer Washburn, Esq., President of Chicago Live-Stock Exchange.

SIR—Your letter to the Hon. Geo. B. Loring, Commissioner of Agriculture, with accompanying resolutions adopted by the Chicago Live-Stock Exchange, have been referred to me for such action as I may deem proper under the circumstances. The material portion of these resolutions appears to be contained in the following words:

"WHEREAS, It has been declared recently by agents of the Department of Agriculture that contagious pleuro-pneumonia now exists to an alarming extent in the State of Illinois; * * * and whereas, apparently well-authenticated reports of the * * * existence of all the contagious diseases with which cattle are ever afflicted have been frequent for many years, and as often found to be utterly without foundation in fact, * * * therefore, * * for the purpose of determining beyond question whether or not the disease now declared * * to exist * * in the State of Illinois is con-

tagious, the Chicago Live-Stock Exchange hereby places at the disposal of the Hon. Geo. B. Loring, Commissioner of Agriculture, ten head of cattle, * * * to be placed among any cattle in the State of Illinois which the honorable Commissioner may be declared to be afflicted with contagious pleuro-pneumonia, and allowed to run and feed with the cattle so diseased, in the same manner as cattle run and feed together on the farm, for the period of three months," etc. The entire expenses to be defrayed by the Chicago Live-Stock Exchange.

These resolutions assume, consequently, that there are two points in the reports of the officers of the Department of Agriculture which are so improbable and so questionable that experiments involving the loss of three months' time in the efforts to control the disease should be made before a definite conclusion is reached, or a decided course of action adopted. These contested points are: 1st. Does a disease exist on the premises and to the extent reported? 2d. Is this disease contagious pleuro-pneumonia?

The first question needs no experiments to decide it. It is a matter of fact which any person or any association can easily determine by visiting the affected herds, or even communicating by letter with the owners. Nothing has been concealed in the reports that have been made. The owner's name, his location, the number of animals he has lost and the number that have been sick have been published again and again, and these reports are readily susceptible of verification or disproof. Surely the testimony of such men as Mr. O. J. Bailey or Mr. D. H. Tripp, of Peoria, or Mr. John Boyd, of Elmhurst, as to the condition of their herds, especially when this testimony is unfavorable to themselves, cannot be called in question. I have before me as I write a letter from one of these gentleman, in which he says: "I am fully realizing in my herd your worst fears." It seems to me, therefore, that the implied suggestion that the reports of this disease were "utterly without foundation in fact" was made without reason, and is unworthy of further consideration.

Admitting, as a fact which cannot be successfully contested, that a disease exists at the places and to the extent reported, we may take into consideration the second question which you have

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raised, viz., is this disease contagious pleuro-pneumonia. In this connection I would respectfully invite your attention to the following facts:

At the first post-mortem examination which I made in this State, at Elmhurst, I invited Mr. J. H. Sanders, member of the late Treasury Cattle Commission, who enjoys the respect and confidence of the great body of cattle-owners of the country, and who is familiar with the appearance of the lungs of cattle affected with contagious pleuro-pneumonia. At the second autopsy were present Dr. N. H. Paaren, State Veterinarian, and Dr. J. H. Rauch, secretary of the State Board of Health, gentlemen eminently qualified for deciding as to the nature of the disease. At my third examination, which occurred in a herd in the State of Ohio to which was traced the outbreak in this State, was present Captain Wm. S. Foster, President of the Ohio State Board of Agriculture. Seven animals were killed at that time, every one of which showed the unmistakable signs of pleuro-pneumonia. At various examinations made by Dr. Paaren in the State of Illinois have been present Prof. Smith, principal of the Toronto Veterinary College, Dr. Holcombe, State Veterinarian of Kansas, and other veterinarians of standing. These gentlemen have without an exception expressed a decided opinion that the disease is contagious pleuro-pneumonia. Dr. Haggard, of Kentucky, an English veterinarian who had heretofore expressed himself to me as skeptical of the existence of contagious pleuro-pneumonia in the United States, was called a few days ago to decide as to the nature of the disease introduced into the herd of Frisbie & Lake, of Cynthiana, Ky., by the cattle from Clarke's herd, of Geneva, Ill. After slaughtering a diseased animal and making a thorough examination he unhesitatingly pronounced the disease identical with the contagious pleuro-pneumonia that he had been familiar with in England thirty years ago. It is a fact, therefore, that the disease in question has been seen by a considerable number of good authorities and that none of these have expressed a doubt of its being pleuro-pneumonia.

In addition to this the owners of most of the affected herds have seen the post-mortem examinations of their animals and can

testify that they died of disease of the lungs, that these organs were greatly enlarged, inflamed and firmly attached to the ribs and diaphragm. There is, consequently, plenty of good evidence that the animals have been sick and have died, and that in all cases there was inflammation of the lungs and pleura, in other words, pleuro-pneumonia.

It is admitted of course that in rare instances a disease is met with in individual animals which may have many of the appearances seen in contagious pleuro-pneumonia; but such cases appear singly, and the disease is not communicated to other animals of the herd, and for the same reason not to other herds. The most conclusive evidence of the contagiousness of pleuro-pneumonia is, consequently, its communicability. I beg to present to you in this connection, therefore, and through you to the members of the Chicago Live-Stock Exchange, the following history of the present outbreak of disease, any and every fact of which I invite you to inquire into and substantiate for your own satisfaction.

In November, 1883, C. R. C. Dye bought a number of unregistered Jersey cattle, which were gathered up in the vicinity of Baltimore and taken to his farm at Troy, O., where his herd was exposed to them. About the 1st of February, 1884, his fine bull Rayon d'Or sickened with symptoms of acute lung disease and died in March. He was examined and found affected with pleuro-pneumonia. Other animals to the number of eighteen afterwards contracted the disease, and seven in all died or were killed by him. September 18th I selected seven of the animals which had been sick and still presented signs of the disease and slaughtered them. Every one was plainly affected with pleuro-pneumonia. We may call this experiment No. 1.

In February, 1884, C. N. Mitchell, of Dayton, O., purchased three heifers of Mr. Dye and placed them with his herd of about thirty animals. As a result seven have died of pleuro-pneumonia and five show plain indications of the same disease. This is experiment No. 2.

Experiment No. 3 was made by A. G. Epler, of Virginia, Ill., who purchased five animals from Dye in January and placed them among the lot sold by him on the 21st of February. Of

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these animals one bought by Mr. Bevis, of Virginia, died; one bought by Porte Yates, of Springfield, died—both of pleuro-pneumonia. A cow brought on Mr. Elpher's farm died of the same disease in June. Another, sold to F. L. Gaston, of Normal, died with suspicious symptoms the 20th of April. Another, purchased by D. W. Rawlings, was sick with symptoms of lung disease. Still another, purchased by M. G. Clarke, of Geneva, Ill., was sick in April, and one that went to J. B. Warlow, of Danvers, Ill., and two that went to Lilly, of Sharon, Ia., died of an unknown disease. Following the introduction of the Dye cattle into this herd then there were seven deaths, three of which certainly were of pleuro-pneumonia. Two cases of sickness with lung disease not ending in death are mentioned above. A third case occurred before the sale; the animal was sold as not fully recovered, is now owned by W. F. Whitson, of Rushville, Ill., and presents plain symptoms of pleuro-pneumonia. A fourth was affected after going to Tripp's, at Peoria. Total, eleven cases.

D. W. Rawlins placed his cow in pasture with a Short-horn cow, which in turn contracted what was evidently lung disease. She has since been slaughtered. Experiment No. 4.

D. H. and S. S. Tripp, of Peoria, purchased three cows at the Epler sale, and this may very properly be called experiment No. 5. One of these afterwards sickened and infected his herd, from which he has lost five, and had an additional one sick at last accounts which he intended to kill.

The disease was carried in some way—probably by persons going from one stable to the other—to Mr. O. J. Bailey's herd, and here we have experiment No. 6. Mr. Bailey had lost five at last accounts. In neither of the above herds is the experiment yet finished.

Experiment No. 7 occurred when W. C. Clarke, of Geneva, took two cows from the Epler sale into his herd. As a result seven head have died, or were killed by him, affected with pleuro-pneumonia, and Dr. Paaren killed two more for the same disease September 24th.

We may refer to the purchase of two cows from Clarke by

C. A. Keefer, of Sterling, Ill., as experiment No. 8. One of these cows died of pleuro-pneumonia and the other has since been killed because affected with the same disease.

Experiment No. 9 was made by John Boyd when he brought two cows from Clarke's infected herd among his beautiful Jerseys at Elmhurst. The record here is fourteen that have died or been killed showing symptoms and post-mortem appearances of contagious pleuro-pneumonia. Twenty-one cows in this herd were exposed, twelve of which, or about 60 per cent., have already contracted the disease; and this in addition to the two that were purchased, both of which were affected.

Experiment No. 10 was Frisbie & Lake's purchase of fifteen head from Clarke's infected farm. These animals were pastured with the 250 which constitute their herd at Cynthiana, Ky. The results so far may be summed up as four dead and ten or twelve sick, with others coming down with the disease almost daily.

Messrs. Frisbie & Lake did not believe in pleuro-pneumonia; they intended to protect their herd to the fullest extent of the law against the supposed sensational reports of interested veterinarians, and they engaged one of the best lawyers in the State to defend them. Probably they accepted the view so industriously circulated in certain quarters that this is a disease of Jerseys and that their grades, at least, would certainly escape. Fortunately just as their case was prepared they decided to have a post-mortem examination made of a sick cow. The result was very well expressed to me by Judge West, their counsel, when he said that the finest legal effort of his life was ruined by that examination.

I have referred above to ten experiments with this disease, involuntary it is true, but experiments nevertheless, seven of which are on a larger scale than is proposed by the Live-Stock Exchange, and are just as conclusive as the experiment which they propose could be. More than six hundred animals, in all, have been exposed and ninety cases of pleuro-pneumonia have so far resulted, in spite of vigorous efforts to arrest the disease. A large number of these animals have been examined after death, and in every one of these has been found the characteristic appearance of the lungs described the world over as peculiar to

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lung plague. In three of the large herds the outbreak is still in progress. In by far the largest herd it has only just commenced, and in two others there will probably be additional cases.

As a matter of fact, therefore, the test of communicability has already been made on a scale compared to which the little experiment proposed by the Live-Stock Exchange sinks into insignificance. After six hundred animals have been exposed and ninety have become affected, the infection in every instance being traceable to one original herd, it appears somewhat ridiculous to be asked to leave all of these cases out of consideration and to rely entirely upon the results which follow from the exposure of ten animals. Can there be any doubt that persons dissatisfied with a test on so grand a scale would be equally unwilling to accept the results with an additional ten animals, even if all succumbed?

An experiment of the kind you propose would require at least three months to produce definite results, and it might be four or five months before a sufficient proportion of the animals were attacked to furnish satisfactory proofs of contagion. By that time we hope to have the West freed from every vestige of the disease, and this will almost certainly be accomplished in Illinois by the slaughter of all affected animals. It is difficult to see what bearing such an experiment would have, therefore, on our course with the present outbreak. Pleuro-pneumonia is a most dangerous disease, which once distributed widely over the country would almost defy our most vigorous efforts to control it. It has already been considerably scattered, and but for the prompt action taken to suppress sales, it would probably be to-day in double the present number of herds. To relax our grasp upon it now, and turn our attention to a course of experiments requiring months of valuable time, might be compared to firemen who could be persuaded to stop fighting the flames and apply the torch to other inflammable structures to learn by experiment whether or not they would burn.

Pleuro-pneumonia is not an unknown disease or one of recent origin; on the other hand, it was studied and described by the earliest authors who wrote intelligently of animal diseases. Its

characteristics are well known, and there is little danger of a competent veterinarian mistaking it even when he sees but one or two isolated cases; and when such cases are multiplied as they now are there is no longer reason for the slightest suspicion that an error has been made. When I say this I refer, of course, to professional men who know something of diseases and the means of distinguishing between them; those who are without this knowledge have no more right to say that the veterinarian cannot diagnose such a disease when he sees it than the hod-carrier would have to say that the chemist cannot distinguish between iron and lead in solution by the reagents on his shelves.

I desire to remind you, in this connection, that the official reports of a responsible officer of the government, selected because of supposed competency in the work upon which he is engaged, cannot be justly compared with the idle rumors started by irresponsible men to which the resolutions refer. In the present instance the importance of correct conclusions was so thoroughly appreciated that the Chief of the Bureau of Animal Industry left very pressing duties at Washington, and has given this outbreak of disease his personal attention and investigation from the beginning. For six weeks the greater parts of his nights have been passed on railroad trains, traveling from place to place, and his days have been given to the laborious work of catching and examining cattle on the pastures of this and adjoining States, and he feels that, whatever may be the opinion of the Live-Stock Exchange, he has done his duty and all that was within his power to protect the enormous cattle interests of the country from an insidious plague that threatens their destruction.

In what precedes I have endeavored to show that the proposed experiment is unnecessary and uncalled for. Had it been considered necessary or even desirable to make such a test the Bureau of Animal Industry would not have hesitated to use the ample funds placed at its disposal by Congress for making such investigations. The insurmountable objection to such an experiment, however, consists in its danger to the cattle industry and the loss which it would bring upon it. Every case of pleuropneumonia in the heart of the stock-raising region of the country

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involves danger to the surrounding animals and causes a feeling of insecurity among owners and buyers which interferes with the movement of cattle, weakens the market, depresses prices and causes a loss to breeders and feeders which soon amounts to millions of dollars. That this danger might be removed and this loss lessened, affected animals have been slaughtered as soon as possible and the progress of the disease has been checked, if not entirely stopped. To change this course and to allow animals suffering from this dangerous disease to live and graze on the pastures of Illinois as you propose, to go beyond this and deliberately set ourselves about propagating this scourge in the very heart of the stock-growing region of America—to follow such a course for three or four months and in the meantime to allow the plague to gather renewed headway in other localities would be idiotic and inexcusable. A well-known cattleman said to me a few days ago that it would be criminal, and I fully coincide in his opinion.

There are other parts of the country where these objections do not apply, and there we have been for months testing the contagiousness of this disease and shall impartially report the results.

I hope that you will see in the facts presented above a sufficient reason why I should decline the proposition of the Chicago Live-Stock Exchange.

EDITORIAL.

CONTAGIOUS PLEURO-PNEUMONIA IN THE WEST.

The appearance of contagious pleuro-pneumonia in the West has, naturally, excited deep and wide-spread anxiety among the parties engaged in the cattle-raising interest. A large number of animals have already been destroyed, and possibly it may become necessary to add many more to the list of the condemned. The Chief of the Bureau of Animal Industry has, so far, fully appreciated the importance of the work in hand, and the gravity of the calamity he has had to confront and overcome, and if he

escapes certain peculiar interferences and objections, and insurmountable obstacles are not put in his way; and if he receives the assistance and countenance to which he is entitled from the people, and from the membership of his profession, he may yet achieve a substantial success. Is this, however, to be the case? Will the true character of the disease become fairly understood and admitted by all? If we may judge from reports which we gather from some of the agricultural journals, it seems more than probable that there will be rebellion and opposition against the measures he has adopted, and that he will not always find the people as willing to pronounce a favorable judgment upon his work as it has at other times received.

To a proposition, coming from the Chicago Live-Stock Exchange, to test the question of the infectious nature of the disease now prevailing in Illinois, Dr. Salmon replied in a long letter, which we publish to-day, not only because it gives the true history of the outbreak, but also because it shows the uselessness, in the opinion of that gentleman, of entering upon new experiments of the kind suggested. No one who is thoroughly acquainted with the disease, and who has followed the reports of its outbreak and progress in the West, can fail to agree with Dr. S. No further experiments are needed, and to resort to them now would be to a great extent a practical acknowledgment of previous error on the part of any veterinarian who should consent to lend the self-stultification of such an act. For this reason, the experiment which it has been proposed to undertake in the East, at Barren Island, must be stopped. If it is allowed to proceed, people may reasonably ask to be enlightened as to the necessity of accepting one and repudiating the other, and the only plausible answer the question will admit will be that the disease of the East, which we have been recognizing as pleuropneumonia, is an entirely different one from that which exists in the West.

We are also in fear lest Dr. Salmon should ere long encounter objections which may prove still more formidable than these, and which will not derive their importance from their own intrinsic soundness, but rather because they will have originated within

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the ranks of the veterinary profession. We must be allowed to remind him of the Blissville affair, occurring some years ago, and of the Brooklyn cases which transpired recently. The fact that there are veterinarians who deny the existence of contagious pleuro-pneumonia in the East, in the very center of its bed growth, and who will, in all probability, succeed in impressing their views widely at the West, will, we fear, become the source of not a little annoyance to him, and may become the source of a serious and active opposition which may be brought to bear upon his efforts to stamp out the disease in the West.

OUR REGISTER OF REGULAR GRADUATES.

Our recent call to veterinarians and to our readers to second our efforts to obtain the proper material for the construction of a register of the regular graduates of veterinary medicine in this country has elicited many replies, expressing approval of the object proposed, and accompanied by many names which might otherwise have been difficult to obtain. The result is that we have been able to present to our readers and the public the names of a large number of veterinarians holding their diplomas from the veterinary schools of the United States and of Canada. In our present number we give the concluding portion of the catalogue, being lists of the Alumni of the New York College of Surgeons previous to 1875, and of Cornell University, with the names of graduates of European schools as far as we have been able to collect them.

While we feel confident that our list of American graduates is as complete and correct as it is now possible to make it, we fear that those of the veterinarians of European schools is by no means perfect, and as we feel bound to render them equal justice with the others, we take this last opportunity to call upon our friends to furnish us with the names of all persons who may be known by them to possess a right to a place in the register. The names, places, and if possible the years of graduation, are the facts we need to enable us to complete our list.

Proper corrections will be made of any omissions or inaccuracies discovered and indicated to us.

REGISTER OF GRADUATES OF VETERINARY MEDICINE.

Continued from page 311.

ALUMNI OF THE VETERINARY DEPARTMENT OF CORNELL UNIVERSITY.

Farrington, A. M.....	Garfield, N. J.
Kasson, N.....	Springville, Pa.
Salmon, D. E.....	Washington, D. C.

ALUMNI OF THE NEW YORK COLLEGE OF VETERINARY SURGEONS.

Bell, L. I.....	1871
Blakely, Richard P.....	1875
Burden, Charles.....	1868
Cosgrove, John B.....	1875
Dougherty, William.....	1874
Fernsler, Philip B.....	1874
Finlay, Robert W.....	1873
Hopkins, James D.....	1873
Herr, Benjamin H.....	1874
Michener, Charles B.....	1874
Meyer, John C., Jr.....	1874
Nostrand, Elbert.....	1867
*Nostrand, Peter.....	1871
Outerbridge, Theodore.....	1875
Peters, Peter.....	1873
Robertson, James L.....	1867
*Stocker, Charles H.....	1874
*Travers, Ernest.....	1875

*Deceased.

ALUMNI OF THE ROYAL COLLEGE OF VETERINARY SURGEONS. (England.)

Taken from the Register of 1882.

Barr, Alexander.....	1874
Beech, T. Simpson.....	California.....1835
Bolton, Geo. Frederick.....	Montreal.....1864
Bushman, Joseph Thomas.....	Washington, D. C.....1862
Carmody.....	New York.....
Casewell, John.....	California.....1871
Clark, John.....1854
Clemenson, John.....	Allègheny City.....1843
Coleman, J. B.....1869
Coster, L. H.....1870
Frater, W.....1830
Frazer, J. I.....	Rochester, N. Y.....1876
Gadsden, J. W.....	Philadelphia, Pa.....1858
Grayson, J.....	Pennsylvania.....1845
Haggard, E.....1839
Heard, J. M.....	New York.....1871
Hingston, J. C.....	Bay City, Mich.....1877

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McEad
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McInn
McLea
Mellor
Moore,
Murray
Ogden,
Osgood
Perry,
Plagem
Preston
Quickf
Rice, F
Scally,
Shaw, T
Simmon
Smith,
Stickney
Talbot,
Taylor,
Treacy,
Vasey,

Chambo
Huideko
Klench
Liautard
Morice,

Billings,
Detmers
Meyers,

NE.	Hoey, J. W.....	1840
	Howell, H.....	Massachusetts.....1870
	Hulme, T. D.....	1868
SITY.	Jay, D.....	Davenport, Iowa.....1866
eld, N. J.	Laidlaw, R.....	Albany, N. Y.....1840
yville, Pa.	Large, A. Prof.....	Great Barrington, Mass.....1861
on, D. C.	Law, James, Prof.....	Ithaca, N. Y.....1861
NS.	Lander.....	1890
	Leverett, C. R.....	United States Army.....1871
.....1871	Lillyman, W. H.....	Boston, Mass.....1840
.....1875	Lockhart, A.....	New York City.....1865
.....1868	Loudon, A.....	Boston, Mass.....1869
.....1875	Lyman, C. P.....	Boston, Mass.....1874-'79
.....1874	McEachran, D., Prof.....	Montreal, Canada.....1860
.....1874	McDonald, J. G.....	1844
.....1873	McInnes, B., Jr.....	Charleston, S. C.....1874-'80
.....1873	McLean, L.....	Brooklyn, N. Y.....1854-'80
.....1874	Mellor A.....	Philadelphia, Pa.....1872
.....1874	Moore, E.....	Albany, N. Y.....1877
.....1874	Murray, A.....	Detroit, Mich.....1862
.....1867	Ogden, C. E.....	United States Army.....1873
.....1871	Osgood, F. H.....	Springfield, Mass.....1881
.....1875	Perry, E. M.....	New Bedford, Mass.....1878
.....1873	Plageman, L. V.....	Brooklyn, N. Y.....1863
.....1867	Preston, F. W., Prof.....	Champaign, Ills.....1869
.....1874	Quickfall, J. K.....	1858
.....1875	Rice, F. A.....	Hartford, Conn.....1881
	Sally, G.....	St. Louis, Mo.....1858
gland.)	Shaw, Th.....	1871
	Simmons, W. F.....	Boston, Mass.....1881
.....1874	Smith, A., Prof.....	Toronto, Canada.....1861
.....1835	Stickney, J. H.....	Boston, Mass.....1859
.....1864	Talbot, B.....	New York.....1864
.....1862	Taylor, J. N.....	Utica, N. Y.....1863
	Treacy, M. J.....	Fort Totken, Dakota.....
	Vasey, N.....	Troy, N. Y.....1872

ALUMNI OF THE FRENCH SCHOOLS.

Chambon, E. D. E.....	Jersey City, N. J.
Huidekoper, R. S., Prof.....	Philadelphia, Pa.
Klench.....	Canada
Liautard, A., Prof.....	New York City, N. Y.
Morice, J.....	New Orleans.

ALUMNI OF GERMAN SCHOOLS.

Billings, F. S.....	Boston, Mass.
Detmers.....	Champaign, Ills.
Meyers, J. C., Jr.....	Cincinnati, Ohio.

ILLNESS AND RECOVERY OF DR. FLEMING.

The *Veterinary Journal* of October, which excited our apprehensions with the painful intelligence of Dr. Fleming's illness, brings also an antidote to our anxiety in the gratifying announcement of his recovery. The veterinary profession at large will rejoice over the latter statement, and will join us in tendering to the doctor our hearty congratulations, with our sincere wishes for his complete restoration to a degree of health and vigor which shall insure a long continuance of the services he is so amply qualified to render to the public, and the honor his career is destined to reflect upon the cause of veterinary medicine.

A CORRECTION.

There appeared in the October number of the *Journal of Comparative Medicine* amongst the correspondence, a letter attacking our veracity in relation to the action that took place last March between the American and Columbia Veterinary Colleges. We intend to answer it, and to lay before the public and profession the facts as they exist, but the pressure resulting from more important matters has obliged us to postpone our reply until our next issue.

REPORTS OF CASES.

AMERICAN VETERINARY COLLEGE.—HOSPITAL RECORDS.
AMYLOID DEGENERATION OF THE LIVER—SOFTENING OF MUSCULAR COAT OF THE INTESTINES—COLICS—DEATH.

By J. E. RYDER, D.V.S., HOUSE SURGEON.

On the 29th of May I was called to examine a horse which had been taken ill on returning from a drive. He was a gelding, six years of age, and was found to be suffering with spasmodic colic. I gave him a seven drachms ball of chloral, which relieved him in a short time. He passed a quiet night, and was found the next morning apparently well and eating his bedding. Two days later he was driven about five miles, in the morning, and in

the evening had another attack of colic. This time the chloral failed to give him relief, and he was then placed under the administration of tinct. opii., $\frac{3}{4}$ ss. every hour. Three hours later all the symptoms had subsided, and the next morning he was again found in usual apparent health. Supposing the trouble to be due to some irritating substances in the intestinal canal, possibly to hardened feces, it was thought proper to give a good cathartic, and for that purpose he was prescribed a seven drachms dose of aloes. About 3 o'clock of the same day the colicky symptoms reappeared, more severely than before, and he was brought to the hospital of the college.

A more careful examination of his history brought out the fact that he was a valuable trotting horse; that he always had been narrow in his belly; that he was a fast eater, but that his appetite was very capricious; that he required to be coaxed to eat, especially after hard work, and that bran had to be given to him, mixed with his oats, to stimulate his appetite. He had shown no signs of constipation, and had passed his feces in coming to the hospital, though rather of a diarrheal nature.

On admission his temperature was $101\frac{1}{2}$; pulse, 50; respiration, 40, and he had severe abdominal pains. Stimulating frictions were made to his abdomen, and he was placed under tincture opii in ounce doses every hour. Towards morning he became quiet, and the administration of the tinctura opii was reduced to every three hours.

He had passed no manure; temperature, $100\frac{1}{2}$; pulse, 44; respiration, 20. His general condition was good. Half a pint of linseed oil was administered, with directions to leave him alone and watch his condition, with administration of opiates if the case seemed to indicate it. On the following day his bowels began to move nicely. His condition was very favorable, and all treatment was suspended, careful attention being given to his diet, though his appetite was excellent.

Forty-eight hours afterwards, as he was about being discharged, he refused his food. His temperature suddenly rose to 104° , his pulse and respiration increased, and severe contractions of the diaphragm with thumping took place. This was controlled by aconite and opium.

On the following day his bowels moved very freely, purging well. His temperature kept up and his pulse rose to 125. Some colicky pains again showed themselves; he soon broke out into a profuse cold perspiration; his body became cold, and after a severe spasm of pain he fell and expired in a few minutes.

The post-mortem examination was made immediately and the following lesions were found: *Stomach*—Lesions of chronic gastritis, with a large, deep ulceration through the mucous coat, in the middle of the cardiac portion. *Intestines*—Slightly congested, with the muscular coat considerably softened, the softening process rendering the removal of the organ very difficult, from its tearing so readily under the slightest traction. The *Liver* was greatly enlarged. It weighed eighteen pounds, and had undergone waxy degeneration throughout its whole extent. The *Kidneys* were somewhat pale in color, but otherwise in a normal condition, as were indeed the remaining organs of the body.

PROGRESSIVE PARAPLEGIA—NECROSIS OF THE DORSAL VERTEBRÆ—DEATH.

By F. ALLEN, D.V.S., HOUSE SURGEON.

The latter part of July there came under my observation, at a free clinic, a gray gelding, nine years of age.

This horse had been used as a cart horse for drawing manure. As he was led into the hospital he showed an unsteady gait, his body swaying from side to side, from an inability to control his hinder extremities.

His temperature, pulse and respiration were all normal, and his appetite good.

Careful inquiries were made in regard to the history of the case, but no facts of importance could be learned. It was thought at that time that the horse must have fallen and strained his back, or that he had been injured in some other way, but this was denied by the owner and also by the driver. As no lesion could be detected, he was placed under treatment, being governed by the symptoms presented. He was placed on nerve stimulants—*nux vomica*, in drachm doses with a little gentian and glycyrrhiza, three times a day. He was taken home, and as

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we learned since, was worked about a week. He was again brought back on August 2d, showing no improvement, but being a little worse the dose of nux vomica was increased to a drachm and a half three times a day, with strict orders not to work him, but to keep him as quiet as possible.

On August 11th he was again returned, and was taken into the hospital, where he remained until destroyed. His gait was now very uncertain, and it was with great difficulty that he was made to walk to a stall. As he did so, he dragged his toes, crossed his legs, and the hinder portions of the body rolled from side to side, unless steadied by the tail.

The actual cautery was applied in straight lines over the whole back, and a severe blister applied to the sacral vertebræ, extending well forward. The animal was then put in slings and kept quiet, receiving for treatment sulphate of strychnia three times a day, beginning with half grain doses, and increasing it by degrees until he received nine grains a day. His appetite and all his functions were normal and in good working condition. Carefully watched, no change, however, was observed. When removed once from the slings and moved out of his stall he walked in the same irregular manner, as unsteady and as unconscious of where his feet were going to rest. He seemed to lose ground as to his strength, and after much pain, to prevent his falling, he was placed back in the slings, where he remained till the 27th.

On that day he was removed from his immobile position, and walked with care to a large box stall, situated on the second floor of the hospital. The journey was accomplished without very great difficulty, and he was then turned loose, with directions to be placed in slings at night. The strychnia was continued.

One day while moving about in the stall he fell down, but after lying for a few minutes he got up, though with great difficulty. He was seen several times in a sitting posture, like that of a dog. During all this time his appetite had been good, and he was eating nine quarts of oats a day with hay.

On the 30th of August he laid down about six o'clock, and it was with great difficulty that we were able to raise him to his feet by the use of slings.

At seven o'clock he gave out, settling back in the slings so that he nearly slipped out backwards. The slings were then removed, and he continued lying down. He was seen up but once after this, and then only for a few minutes. On the 1st of September he was thrashing about so that he was pithed late in the evening. At this time he had complete paralysis of both hind extremities.

On post-mortem examination nothing wrong was noticed until, while trying to exhibit the spinal marrow, we reached the seventh, eighth, ninth and tenth dorsal vertebræ of this region. A large clot of blood was found in the muscles, which were besides thickly infiltrated with blood in their entire thickness, the annular portion of these vertebræ being also more or less diseased. The seventh presented a small necrotic surface at the base of the posterior border of the superior spinous process. The annular portion and base of the spinous process were destroyed on the right side of the median line, the necrosis extending through the bone into the spinal column. On the ninth the necrosis was not quite so extensive. It appeared principally towards the transverse process, but there also were perforating the bone right through. The tenth presented only slight necrosis at the base of the transverse processes. The vertebral canal was filled with blood, and the spinal marrow too much softened to permit any examination.

All the other organs of the body were healthy.

ACUTE RHEUMATISM.

By H. F. JAMES, V.S.

Was summoned October 5th, about 4 p. m., to attend a bay horse which had been exposed for some hours in the rain two days before, and was now reported to be very sore, and entirely off his feed. On examination found temperature 105° , pulse 75 and wiry, respiration 50 and very laborious. Fore legs, especially the knees, and the hind legs from the hocks down exquisitely tender to the touch and swollen. Diagnosis—acute rheumatism; prognosis—doubtful on account of the great respiratory disturbance, which indicated implication of the valves of the heart. Admin-

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stered acid salicyl. $\frac{3}{4}$ ss in bolus, and enough of the injectio quiniæ hypodermica to equal quinia sulph. 3 ij. Every two hours gave acid salicyl. 3 ij in bolus, and the hypodermica equivalent of quinia sulph 3 j. At 12 p.m. the nostrils were dilated, respiration 60 and very laborious, pulse intermittent, and a friction sound on auscultation behind left elbow. Applied a strong fly blister over this region, gave my patient acid salicyl. 3 vj., and a rousing stimulant, and left him for the night.

October 6th, 7 a.m.—Temperature 104°, pulse 60, breathing nearly natural. The rheumatic swellings had almost entirely subsided, and he could bear the pressure of my hands very comfortably on his hocks. Gave 3 ij doses of the acid and 3 j of quiniæ hypodermically every three hours during the day. 6 p.m.—Temperature 103½°, pulse 60.

October 7th, 7 a.m.—Temperature 103°, pulse 52, crackling in joints has nearly ceased, less clear and hard, no pain on pressure. Ceased the quiniæ, but gave 3 vj of the acid during the day.

October 8th, 7 a.m.—Temperature 102°, pulse 50. Gave same doses of the acid as yesterday. 6 p.m.—Temperature 100½°, pulse 45.

October 9th.—Temperature and pulse normal, no crackling of the joints, and walks as well as he ever did.

There had been complete anorexia from the first, which I think was partly due to the well-known unpleasant stomachic effects of salicylic acid. The bowels opened on the third day, and as the kidneys were inactive gave pot. nit. freely in the drinking water. He was a plethoric animal, and as he seemed willing to emulate Dr. Tanner and drink lots of water, I did not trouble myself much about his prolonged inappetence. All the symptoms subsided nicely; directly I stopped the acid, the appetite returned, and to-day he is as well as ever. I think this case well exemplifies the anti-rheumatic value of salicylic acid, especially in the acute form. Watch the pulse and temperature carefully, and push the acid until you get the effect you want, and keep it up until the crackling in the joints has entirely ceased. It has never disappointed me in acute rheumatism.

Will other members of the profession kindly record their experience of this agent?

DECLAT'S SOLUTION.

By H. F. JAMES, V.S.

This addition to our therapeutic agents will undoubtedly be liked by those who give it a trial. It has not the escharotic properties of carbolic acid, it favors granulation to a remarkable extent, and is a powerful antiseptic. I have used it for nearly a year as a substitute for carbolic acid in broken knees and such cases as it is desirable to have free granulation. Lately I saw an article in the *REVIEW* advising its use in quittor. A case of that disease presenting itself soon after, I followed the treatment recommended, but soon discarded the use of the bandage, which even with an interposed layer of antiseptic batting, made the animal very uncomfortable, and with strick cleanliness, attention, and the use of the solution twice a day, the case, which was a very bad one, is now nearly well. It may be used like carbolic acid with oil, but in almost any ratio you desire, without proving escharotic.

NEW VETERINARY COLLEGE.

VETERINARY DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA.

Special Report for the *REVIEW* by W. L. ZUILL, M.D., D.V.S.

The opening of the Veterinary Department of the University of Pennsylvania took place on Thursday, October 2d, at 12 o'clock. The opening address by Prof. Rush Shippen Huidekoper was a very able discourse, on the history, past, present, and future, of the veterinary profession. In his discourse, he referred to the feeling of pride which filled him at his selection for the duty of delivering the inaugural, not because he was an alumnus of the University, but because he was a member of the family of the founder of the Medical Department 119 years ago. The meeting, a memorial one for this department, brought out a large

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assemblage of the profession from all parts of the city and neighboring towns, showing the great interest felt in this latest offspring of a world-renowned institution of education, science and literature. All present were well pleased with the facilities which the school afforded for the study of this branch of science, and predicted a great success for its future. There is a class of 24 attending lectures in this department. This is, I believe, the largest with which any school began its first year, and this number promises to increase. Beside these, there are several taking special courses.

For this year only the first or junior course of studies will be required. This is the same as is required in the Medical Department, and when the students of the Veterinary Department will be instructed, with the exception of Anatomy, Forging and Dissections, with some little change in the laboratory work, as is shown by the rosters of the two departments.

With the exception of Prof. Huidekoper, the faculty of this department are composed of professors from the Medical Department, all of whom have a world-wide reputation in their specialties. The chairs at present filled are, Internal Pathology, and *pro tempore*, Veterinary Anatomy, by Prof. Rush Shippen Huidekoper; General Pathology and Morbid Anatomy, by Prof. James Tyson; Materia Medica, Pharmacy and Therapeutics, by Prof. Horatio C. Wood; Chemistry and Toxicology, by Prof. Theodore G. Wormley; Physiology, by Prof. Harrison Allen; Botany, by Prof. Joseph T. Rothrock; Comparative Anatomy and Zoology, by Prof. Andrew J. Parker; Comparative Physiology, by Prof. Robert Mead Smith.

Among the Demonstrators, that class of instructors who form such an important adjunct of the faculty of all schools, and whose services it is hard to overestimate, I notice the name of Dr. W. Horace Hoskins, as Demonstrator of Anatomy, an alumnus of the American Veterinary College. This may be taken as additional evidence, and embodied in the history of our alumni, that many of the graduates of our alma mater are rapidly advancing to fill the higher positions of our calling, the duties of which they are well fitted to perform, by reason of the excep-

tional curriculum demanded by our school. This is also proof that the labors of the pioneer workers in our beloved profession in this country have not been in vain, that their struggles against hope have not been for naught, but as a glorious result, sending into fields which they have followed, workers of ability and promise. But I must not let love for my alma mater lead me too far from the subject matter that I have in hand. To return, I find as Demonstrators of *Materia Medica*, Therapeutics and Pharmacy another veterinarian, Dr. Alexandria Glass, a graduate of the Montreal school, Dr. Henry F. Formad, Demonstrator of Pathology and Morbid Anatomy, and Adolph W. Miller, Demonstrator of Pharmacy. The corps of professors and demonstrators is not yet complete, and will receive several valuable additions to its number during the coming year. Among the chairs remaining to be filled may be mentioned Veterinary Anatomy, Cattle Pathology, Obstetrics and Surgical Pathology, with several other branches of minor importance. This department of the University has been under contemplation for some time, and was made practicable through the acquisition of the land from the city of Philadelphia. The amount of money necessary to put up the buildings was obtained through the liberality of Mr. J. B. Lippincott and Mr. James E. Gillingham. These buildings, which are replete with every convenience, are built on the two sides of a triangle, thus enclosing a convenient and very spacious yard, the entrance to which is at the base of the triangle. The side elevation of these buildings has a front age on Pine street, and terminates at the apex in a large two-story, octagon-shaped room, particularly well lighted and ventilated, the ground floor of which is the lecture room, capable, I should judge, of accomodating about 200. The second floor is being fitted up for the museum. Opening into this from the left, or Pine street branch, are private anatomical laboratory rooms, with offices of the secretary, janitor, etc. On the other side of the triangle we have on the first floor the dissecting room and forging shop; these rooms have every appliance necessary to facilitate the work to be carried on in them, both for instructor and student. On the second floor of this building will be found

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the pathological, physiological, historical and pharmaceutical laboratories, which are fitted with desks, tables, microscopes and all other conveniences necessary for the work to be done in these departments. The Hospital Department is not yet built; it is intended to accommodate about 50 head of horses, also a dairy for about 50 head of milch cows, which is expected to be self-supporting. Those buildings when finished will be so arranged that only the first or ground floors will be used for hospital and dairy purposes. The second and third floors will be fitted as dormitories for the use of students. Taking into consideration the favorable circumstances attending the birth of this new school, leaning on the reputation of one of the noblest institutions of learning in this country, it seems to me almost impossible for even the shadow of failure to fall across its pathway. Therefore, there is but one thing for it to do, and that is to stride onward and upward in the victorious course it has laid out for itself, and thus to aid in the elevation of a noble and honorable calling to the plane occupied by its sister profession.

REVIEWS.

ANATOMY OF THE HORSE, by PROF. McFADYEAU, of the Royal Veterinary College of Edinburgh.

We have enjoyed the opportunity, through the kindness of W. R. Jenkins, our popular veterinary publisher, of examining some of the advance sheets of this new work. This examination warrants the opinion that it will prove to be a good book for the veterinary student, though probably not so much a book on descriptive anatomy as a practical guide to the proper dissection of parts. The work will form a volume of about 350 pages, and is to be extensively illustrated with colored lithographic plates and wood cuts.

A TEXT-BOOK OF OPERATIVE VETERINARY SURGERY, by G. FLEMING, LL.D., F.R.C.V.S. Part I. (W. R. Jenkins.)

Dr. Fleming has once more placed his name on record in

veterinary literature, and has again proved his claim to rank among its most valuable contributors. Not satisfied with the long list of books and pamphlets and scientific articles which he has already produced, he comes to-day and presents to the veterinary profession at large, to practitioners as well as to students, the first and only work on operative surgery which has been published in the English language.

The issue of the book has been promised for some time, but if our patience has been put somewhat on trial by long waiting for its appearance, none of those who shall at length become its readers will hesitate to own that they have been amply rewarded at last for the postponement of their expectations.

The first part, on operative surgery, forms a neat collection of 266 pages, handsomely illustrated with 295 wood cuts, equal, and in many instances superior, in execution to any of similar nature we have seen.

After a few introductory pages, devoted to generalities, we encounter sundry chapters comprehending a variety of subjects, which may perhaps be properly denominated miscellaneous, such as the various means of restraint: the use of anæsthetics; then, simple operations of minor surgery, covering the different modes of the division and reunion of tissues. Then, passing to the second part, we are treated with operations on bony structures, fractures and dislocations; the removal of tumors, cauterization, setons, various modes of infection; operations on blood vessels, on muscles, on bones, and, in fact, upon all the organs of the function of locomotion; operations on the nerves, amputations, extraction of foreign bodies from wounds, etc., etc.

Operative Veterinary Surgery supplies a great and pressing need in veterinary literature. It is written in the peculiarly clear and intelligible style of the author, and is the work of a man who has been for many years engaged in this peculiar field. It is a book which no veterinarian or veterinary student, nor even the veterinary teacher, can dispense with, whether as a means of original education, or of reference for the proficient.

The English edition, which is published unbound, has been much improved by the strong and neat binding with which the American publisher, Mr. Jenkins, has clothed it.

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PHYSIOLOGICAL CRUELTY—FACTS *vs.* FANCY. (John Wiley & Son, N. Y.)

This neat little volume would prove as useful an acquisition to the library of the veterinarian as to the physician. It discusses the subject upon which it treats clearly and with fairness, and in a very proper style presents to the determined anti-vivisectionist arguments which must prove very difficult, if not impossible, to overthrow.

A. L.

SOCIETY MEETINGS.

MASSACHUSETTS VETERINARY MEDICAL ASSOCIATION.

The fifth regular meeting of the M. V. A. was held October 1st, 1884, and called to order at 8 P. M., with W. Bryden in the chair.

Nine members answered the roll-call, and then the minutes of the last meeting were read and adopted.

Moved and seconded that Dr. Lyman's resignation be accepted. Carried.

Moved and seconded that the Chair appoint a committee of three to bring in a name for the executive committee to fill the vacancy caused by Dr. Lyman's resignation. Carried.

Simmons, Winchester and Flaunders were appointed, and Dr. Byrne's name was presented.

Moved and seconded that Dr. Byrne fill the vacancy on the Executive Committee. Carried.

The following paper was read by Dr. Skally on Gangrene, and after a general discussion a vote of thanks was tendered him. Dr. Blockwood was appointed next essayist.

J. F. WINCHESTER, D.V.S., *Sec.*

GANGRENE, NECROSIS, MORTIFICATION.

Under gangrene is understood the death of an organ or part, as manifested by the more or less rapid breaking down and chemical decomposition of its texture. Gangrene may affect both soft and solid structures, the bones, for instance, or even fluids, as in necrosis or sepsis of the blood. The breaking down of structures is generally a slow process, whilst in soft, juicy textures, and in fluids,

it is rapidly consummated. Like normal textures, new formations of every kind, tumors, exudates, pus, are liable to become necrosed. Fluids degenerate through necrosis into gangrenous ichor, the most infectious and destructive of its tribe.

A general characteristic of gangrene is not easily given, so manifold are its forms, and so various are its causes. Soft parenchymata commonly breaks down into a diffuent pulp, marked by a high degree of discoloration and of fœtor. As decomposition proceeds, gases are generated in the part, principally sulphuretted hydrogen, ammonia, nitrogen and carbonic acid. These give rise to the emphysematous crackling which is so often associated with the gangrenous processes. The tissues at the same time undergo a process of softening or liquefaction, the limb becomes exceedingly offensive, and, owing to alterations in the transuded hæmoglobin, changes from a reddish color to a brownish or greenish black. The characters of the dead part vary with its structure, its vascularity, the cause of the gangrene, the acuteness of the process, and the possibility of the access of atmospheric air. The more vascular the part, the softer the structure, and the more it is exposed to the atmosphere, the more rapidly and completely does it undergo decomposition.

Bones, cartilages, and tendons, which are firm, hard tissues, containing comparatively but few vessels, undergo very little alteration in structure and form; whereas softer parts are much more rapidly and completely destroyed.

The occurrence of decomposition manifests itself in the first place in the blood contained in the part. The hæmoglobin escapes from the red blood corpuscles, partly by exudation, and partly by the destruction of the corpuscles themselves, and dissolved in the liquor sanguinea, permeates the surrounding tissues. The corpuscles are ultimately completely annihilated, nothing remaining but a few minute granules. The staining of the tissues with the hæmoglobin is known as *post mortem* staining, and the appearances it presents are very characteristic.

All the tissues may be more or less affected, but the living membranes of the heart and large blood vessels, being in immediate contact with the blood after death, are naturally more so than other parts.

The staining is of a uniform pinkish red color, thus differing from the punctiform and stratiform redness of hyperæmia, from which it must be carefully distinguished.

The amount of staining is in proportion to the rapidity with which the decomposition has taken place, and to the amount of blood contained in the part at the time of death. Gangrene has the import sometimes of a local, sometimes a symptom, of general disease. The conditions necessary to the former case are nearly reducible to arrested afflux of blood; that is, stasis. It may begin by attacking fluid parts, and especially the blood, and extend from these to solid structures, or it may affect them all at once.

DEVELOPMENT OF GANGRENE.

Gangrene is developed—

First.—Out of absolute blood stasis, which may occur under various circumstances.

(a) Every hyperæmia in organs, or sections of organs, particularly in paralyzed or enfeebled, or obnoxious to debilitating influences, may degenerate into absolute stasis. This applies particularly to asthenic, hypostatic, hyperæmia in

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(b) Mechanical hyperæmia frequently becomes absolute stasis as seen in incarcerated, strangulated organs, and as a result of the plugging of the returning vessels in the lower extremities.

(c) Every inflammatory stasis may degenerate into absolute stasis, more particularly those hypostatic and asthenic inflammations which occur in organs already diseased, paralyzed or depressed by violent external influences, such as concussion, contusion, heat or cold. An inflammation consequent upon influences directly or indirectly debilitating, may acquire during its progress, a tendency to absolute stasis.

In absolute stasis, the blood undergoes gangrenous decomposition. Hence the blood is the portion originally necrosed and dissolved. It exudes in a state of gangrenous ichor through the walls of the blood vessels, causing the same gangrenous decomposition in these and in the surrounding tissues. This event gives rise to the most ordinary and most developed form of moist gangrene. The progress of this gangrene is more or less acute, the gangrenous dissolution of tissues being marked by the rapidity of its course.

Second.—Gangrene is determined by failure in supply of blood.

(a) In impermeability of large arteries,—high degree of carretation, and complete obstruction consequent upon arteritis and ossification.

Here gangrene takes the form of dry, black, nummifying gangrene.

(b) As a result of compression and tension of a part; as in strangulated hernia.

(c) As a result of local destruction of blood vessels, the denudation of parts of attaching and blood supplying textures, bones for example, of their external and internal periosteum, the common integuments of their supporting areolar tissue. The peritoneum of its subjacent layers; isolation of the pleura-pulmonalis over cavities of the lung. This gangrene appears as a white or yellowish white slough.

(d) Extensive impermeability of the capillaries and minute vessels when plugged with coagula or compressed by surrounding exudates. In the last mentioned case, the gangrene is dependent upon inflammation. To this kind of gangrene textures poor in blood vessels, such as compact bones, collasities, etc., are especially obnoxious. The color of the necrosed textures is commonly of a yellow or yellowish green hue.

Third.—The gangrene is the expression of the localization of an anomaly in the blood-crasis, either directly engrafted by contagion or developed out of other crases; a putrid decomposition of the circulating fluid. Blood so poisoned, especially if brought into stasis or into coagulation, possesses, in common with the exudates thrown out by it, an inherent tendency to gangrenous dissolution.

It has already been stated that several varieties of gangrene have been recognized—

1.—Gangrene developed out of an internal cause is distinguished, by the designation of primary gangrene, from that arising from an external cause.

2.—Hot, acute inflammatory gangrene.—True gangrene, in the manner which inflammation leads to gangrene, is sufficiently clear from the foregoing.

(a) The inflammatory stasis, owing to its very intensity, to pre-existing debility of the diseased textures, or lastly to weakening influences caused during its progress, degenerated into absolute stasis.

(b) It occasions gangrene by the crushing effect of its products upon the capillaries, or by mechanical or ulcerous isolation of the textural parts. In this way gangrene may arise in tissues laboring under the sequelæ of inflammation, without itself being an issue of the latter.

2. Cold gangrene, sphacelus.—This form is not in any way connected with inflammation.

Fourth.—Moist gangrene comprises the breaking down of fluid substances to gangrenous ichor and of fibrous textures to a various colored diffuent pulp, marked by the evolution of foetid gases. It is the gangrene developed out of absolute blood stasis; therefore, again, inflammatory gangrene. It may be compared to the decomposition of animal matter under the co-operating influence of water.

Fifth.—Dry, mummyfying and senile gangrene are the various terms designating this form of gangrene, which is caused by a deficient supply of blood. It manifests itself in the perishing of the implicated structures, with shrivelling or withering thereof to an incipiently tough, but eventually sloughing mass. Often and particularly in the extremities, owing to impermeability of their arteries, the gangrenous textures blacken; as such it is comparable to the decaying of organic matter with an insufficiency of moisture, and with the disengaging of pure carbon.

Sixth.—Black gangrene—Gangrenous slough.

Seventh.—White gangrene occurs for the most part, as a result of pressure in incarceration of the denuding of membranous expansions of their subjacent textures, for example, as peritoneal sloughing at the base of intestinal ulcers.

Of these different varieties of gangrene, several are often present at the same time. Beneath the common integuments, often transformed into a swarthy, parched rind, in senile gangrene we often meet with patches of tissue which are reduced to humid, stinking pulp.

Just as in gangrene of solids, gangrenous slough varies, so in like manner does gangrenous ichor, as necrosed blood or exudates vary, according to the crisis or constitution under which either has become attacked with gangrene.

Like normal textures, diseased textures and new growths, fibroid, cancerous formations, for example, may become a prey to gangrene. Neither to ulceration or gangrene are all textures alike obnoxious. Bony, elastic fibrous textures resist gangrene more ably than muscle. Areolar tissue, or mucous membrane, lax embryonic textures, like certain varieties of cancer, are especially prone to gangrenous destruction.

The constituent elements of gangrenous texture masses are more or less well preserved textural debris, larger or smaller black contoured molecules, down to pulverulent granular mass, black pigment granules, fat drops and crystals.

Contact with the atmosphere is by no means indispensable to the generation of gangrene. It affects equally with the external parts, organs never in contact with the air, as the liver and spleen.

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tion of gangrene by an inflammatory process of ulcerative isolation of the gangrenous part through its own secretion. The ultimate healing is brought about by the same inflammatory process changing to one of pus production and of regeneration.

The organs most liable to be affected with gangrene in our practice (veterinary) are as follows, viz.: Peritoneum, stomach, intestine, liver, spleen, bladder, air passages, pleura, lungs, heart, vagina and uterus in female, and penis in male, and the tongue, and gangrene of bones. Of this last I shall not treat, leaving it to be disposed of under the common term applied to the disease, viz.: Necrosis of bone.

Gangrene of the peritoneum in the horse generally results from dividing the cord too high up, causing a high degree of erysipelatous fever, which usually extends to the peritoneum, which along with the cord and surrounding structures, speedily becomes gangrenous. It may also be caused by pressure, as in hernia.

Stomach.—This is liable to become gangrenous through the introduction into it of the various acids in an undiluted state, and of the various caustic alkalies given in large doses by persons who are ignorant of their specific actions. In reference to the intensity of the effect which may cause superficial or deep mortification of the tissues with greater or less rapidity, we distinguish several degrees. The effect is influenced by the quantity and the strength of the liquid, and the duration of the period during which it remains in contact with the parts alluded to. We generally find the effect to be less intense in the cavity of the mouth and fauces, more marked in the œsophagus, and most powerful in the stomach. The entire mucous membrane is destroyed and converted into a black, soft mass, which is distended by a sanguinous fluid, and is easily detached from the muscular coats.

Intestines.—We find these affected by gangrene as a sequel to enteritis and intussusception, but as all these cases will prove fatal, I shall not dwell longer on them.

Liver.—Gangrene of this organ is of a very rare occurrence, but it is sometimes found associated with pulmonary gangrene. It is developed in parts affected with inflammation and suppuration. It occurs in more or less circumscribed spots, in which the parenchyma is dissolved into a brownish black green pulp, which diffuses the characteristic odor of sphacelus. We find suppuration in the vicinity, which is a product of reactive inflammation, and which defines the boundaries of the mortified part.

Spleen.—Gangrene of the spleen is of as rare occurrence as the liver.

Air Passages.—This affection occurs both here and in the parenchyma of the lung in two distinct forms, either as a circumscribed eschar on the mucous membrane, eating its way into the submucous tissue, in which it may occur primarily or as a diffuse gangrenous colliquescence of the bronchial mucous membrane. The conditions under which it is developed are similar to gangrene of the lung, with which it is sometimes combined. It generally, however, occurs in tissues someway previously diseased, but appears rather as an accidental termination than as a necessary consequence of any peculiar local morbid process. It is most commonly associated with pulmonary gangrene.

Pleura—Gangrene of the pleura occurs in consequence of its being denuded

by accumulations of pus or ichor in the costal or pulmonary wall. The pleura then assumes the appearance of a yellowish white, or more frequently of a blackish or greenish brown lax or deliquescent slough, with superficial gangrene of the lung.

Lungs.—Gangrene of the lungs is an affection of not infrequent occurrence, and under certain hepatization of a portion of a lung is a most common complication. There are two distinct forms of gangrene of the lung, viz. : diffuse and circumscribed or gangrenous eschar. In diffuse gangrene we find a portion of the lung presenting an abnormal greenish or brownish tint, filled with a similar colored, somewhat fatty, turbid serosity, soft, rotten, and breaking readily down into a pulpy, shaggy tissue. The whole evolves the characteristic odor of sphacelus. Towards the outer portion the discoloration, infiltration and alteration of consistence are less marked, and finally become imperceptible, and there is no line of demarcation between the gangrenous and the adjacent tissue, which only differs from the normal state in being œdematous and anemic. It corresponds to diffuse gangrene of the bronchial tubes, with which it is almost always associated. Upon the whole it is a rare affection, but when it does occur it always attains a considerable extent, as it commonly attacks one or more lobes. It is, perhaps, scarcely entitled to rank as an independent affection, as it is generally associated with eschar of the lungs, and hence it is more readily developed from the contract of the ichorous, gaseous and fluid products of the gangrenous eschar coming in contact with the bronchial and pulmonary mucous membrane, inasmuch as in all probability the disease extends from the bronchi to the lung tissue. The foregoing description of gangrene as it occurs in the upper lobes is sufficient to render this form intelligible, as well as to explain why there is no inflammatory reaction, and consequently no line of demarcation around the affected tissue. This form of gangrene very often follows as a sequel to fibrinous pneumonia.

Circumscribed or partial gangrene of the lungs appears in the form of gangrenous eschar, and is more frequent than the former variety. We find the parenchyma at some spot of varying size converted into a blackish or brownish green, hard but moist eschar, which adheres to the surrounding tissues, and evolving the peculiar odor of sphacelus, and similar to the eschar produced on the skin by nitrate of silver. It is sharply defined, and becomes gradually loosened from the surrounding tissues, and rests in a cavity corresponding to it in size and form. It may be described as a blackish green plug, which is soft on the surface, with a firm center floating in an ichorous fluid. More frequently the greater portion of the eschar softens and becomes dissolved into a greenish brown foetid ichorous pulp, mixed with rotten, shaggy fragments of tissue, and enclosed in a cavity, whose walls are lined by a shaggy tissue, infiltrated with ichor.

These eschars may either occur singly, or several may be present. If the gangrenous eschar becomes detached it falls into the cavity of the thorax unless there be firm adhesions at the spot, or else it becomes dissolved, and the ichorous semi-solid matter is effused into the pleural sac, and gives rise to pleurisy with ichorous exudation, and to pneumothorax, since the foetid gas evolved from the gangrenous mass either collects alone in the thorax, or atmospheric air finds its way out through the bronchial tubes which opens into the abscess, and thus mixes with the aforesaid gas in the thorax. Partial gangrene often arises in the

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perfectly healthy lungs of weak, decrepit and cachetic animals from general depressing influences, and is developed from a circumscribed passive stasis. Under similar circumstances we find it associated with pneumonia in its various stages, with pulmonary abscesses, with tuberculosis, with bronchitis, or it may be caused by the absorption of gangrenous ichor from gangrene of different parts into the blood.

Heart.—There is nothing at variance with the possibility of the occurrence of gangrene in the muscular substance of the heart. Ulcerations accompanied with malignant products are not of rare occurrence, but the correctness of the observations purporting to refer to gangrene of the heart have nevertheless been called in question by several writers; and we must remark that no case of the kind ever came under our notice.

Uterus.—We sometimes find gangrene of the uterus resulting from inversion, causing a gradual compression of the veins, the vessels become engorged with blood admitted to them faster than it can leave them, and so after intense congestion mortification ensues.

Penis.—We also meet with gangrene of the penis resulting from paraphimosis or strangulation of the glans penis.

Tongue.—The point of this organ is in rare cases found in a gangrenous condition caused generally by the administration of some caustic irritant, such as turpentine, potash, etc.; also by the pressure of the halter rope in leading, when it passed through the mouth enclosing the tongue.

When mortification has a tendency to spread, its dark color is gradually lost in the surrounding tissue. Whereas, when it ceases to spread, a red line, called the line of demarcation, separates the dead from the living tissue. This line is always regarded as most important, indicating that sloughing has ceased to spread, and that a process has begun for the removal of the sphacelated mass from the system. The final act in the separation of dead tissue is that of ulceration of portions of living tissue, which are in immediate contact with the dead. A groove is formed by this ulceration which circumscribes and entrenches the dead part, and then gradually deepening and converging, undermines it until it reaches the centre, when the separation is complete and the slough falls off or is dislodged.

By the discharge of the ulcerated living tissue concomitant with this process of destruction one of repair is set up. As the ulcerated groove deepens, so do granulation cells rise from its surface, so that one might say that which yesterday was ulcerating is granulating to-day, and thus very soon after the slough has separated the whole surface of the living part from which it was detached is covered with granulation and proceeds like an ordinary ulcer towards healing.

ORGANIZATION OF THE BUREAU OF ANIMAL INDUSTRY.

A note received from Dr. E. Salmon, Chief Veterinarian of the Bureau of Animal Industry, indicates the following gentlemen who are acting as members of the Bureau: Drs. W. B. E. Miller, D.V.S., C. B. Michener, D.V.S., T. J. Hoor, D.V.S., H.

W. Rowland, D.V.S., J. W. Hawk, D.V.S., W. H. Rose, V.S., W. Rose, D.V.S., W. H. Wray, D.V.S., M. R. Trumbower, V.S.

Drs. M. Bunker, Farrington and W. H. Rose are in charge of quarantine stations under the Department of Agriculture, and practically, though not officially, also form a part of the Bureau of Animal Industry.

ARMY INTELLIGENCE.

Dr. C. L. Moulton, formerly veterinarian in the active service of the army, having resigned his commission in July, 1884, has been appointed Veterinary Surgeon to the Quartermaster's Department in Washington, in place of Dr. Joseph L. Bushman, M.R.C.V.S., who held the position for several years past.

EXCHANGES, ETC., RECEIVED.

FOREIGN.—*Annales de Bruxelles*, *Revue für Thierheilkunde und Thierzucht*, *Clinica Veterinaria*, *Revue Scientifique*, *Gazette Medicale*, *Archives Veterinaria*, *Recueil de Medecine Veterinaire*, *Echo Veterinaire*, *Presse Veterinaire*, *Veterinarian*, *Veterinary Journal*,

HOME.—*Medical Record*, *Annals of Hygiene*, *Spirit of the Times*, *Turf, Field and Farm*, *Scientific Journal*, *Prairie Farmer*, *Country Gentleman*, *American Agriculturist*.

JOURNALS.—*Gazette of Montreal*, *Hearth and Home*, *Practical Farmer*, *Ohio Farmer*, *Maine Farmer*, &c., &c.

BOOKS.—*Operative Veterinary Surgery*, (by G. Fleming), *Report of the Board of Agriculture*, (of Maine), *Animal Castration*, (by A. Liautard), *Physiological Cruelty*.

CORRESPONDENCE.—G. W. Smith, J. C. Meyer, Jr., J. Winchester, H. T. James, W. H. Pendry, Thos. Sturgis, W. L. Zuill, M. D., C. L. Moulton, Prof. M. Stalker, D. E. Salmon, D. McEachran, W. C. Conklin, F. S. Billings, J. D. Hopkins, W. H. Hoskins, J. A. Waugh, A. A. Holcombe, R. S. Huidekoper.

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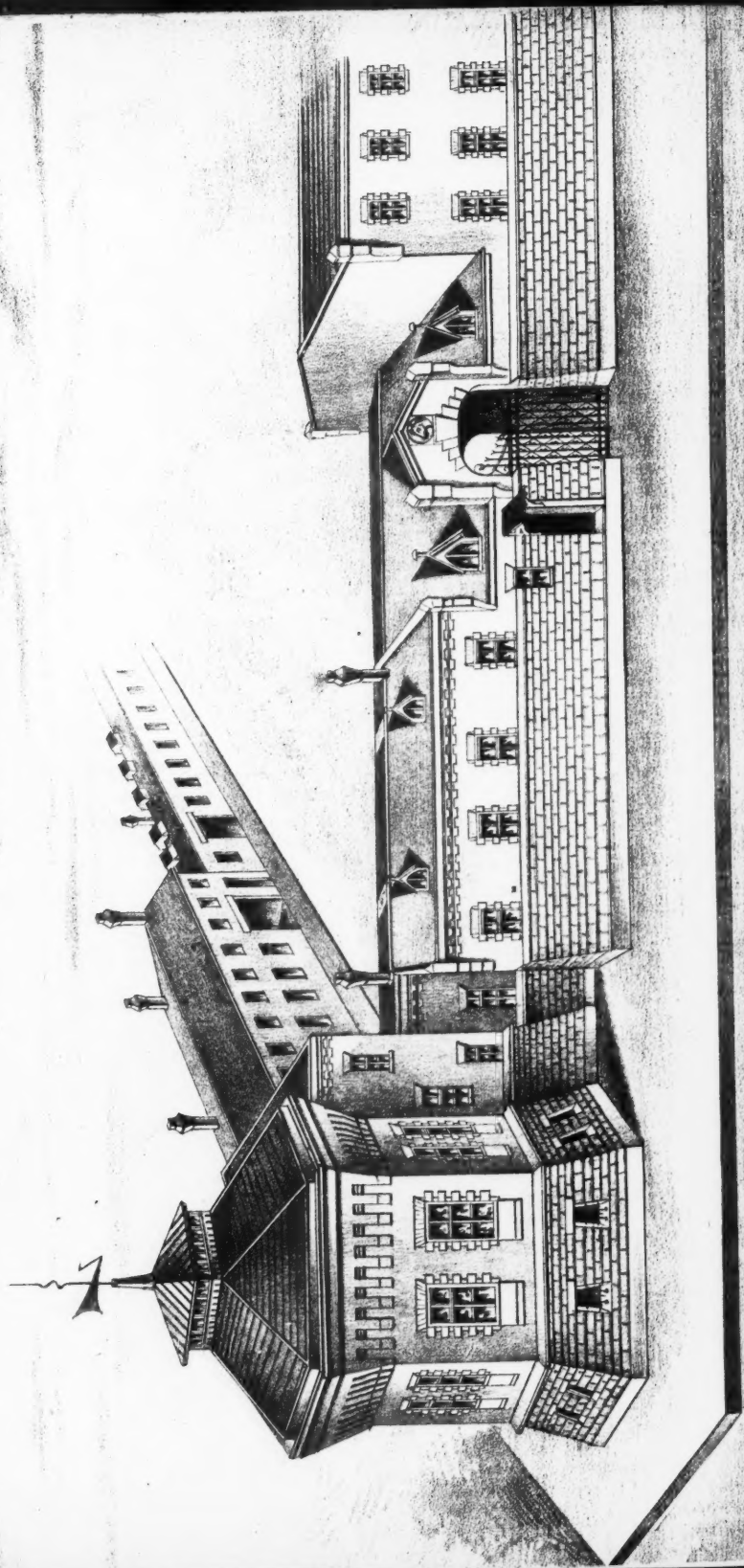
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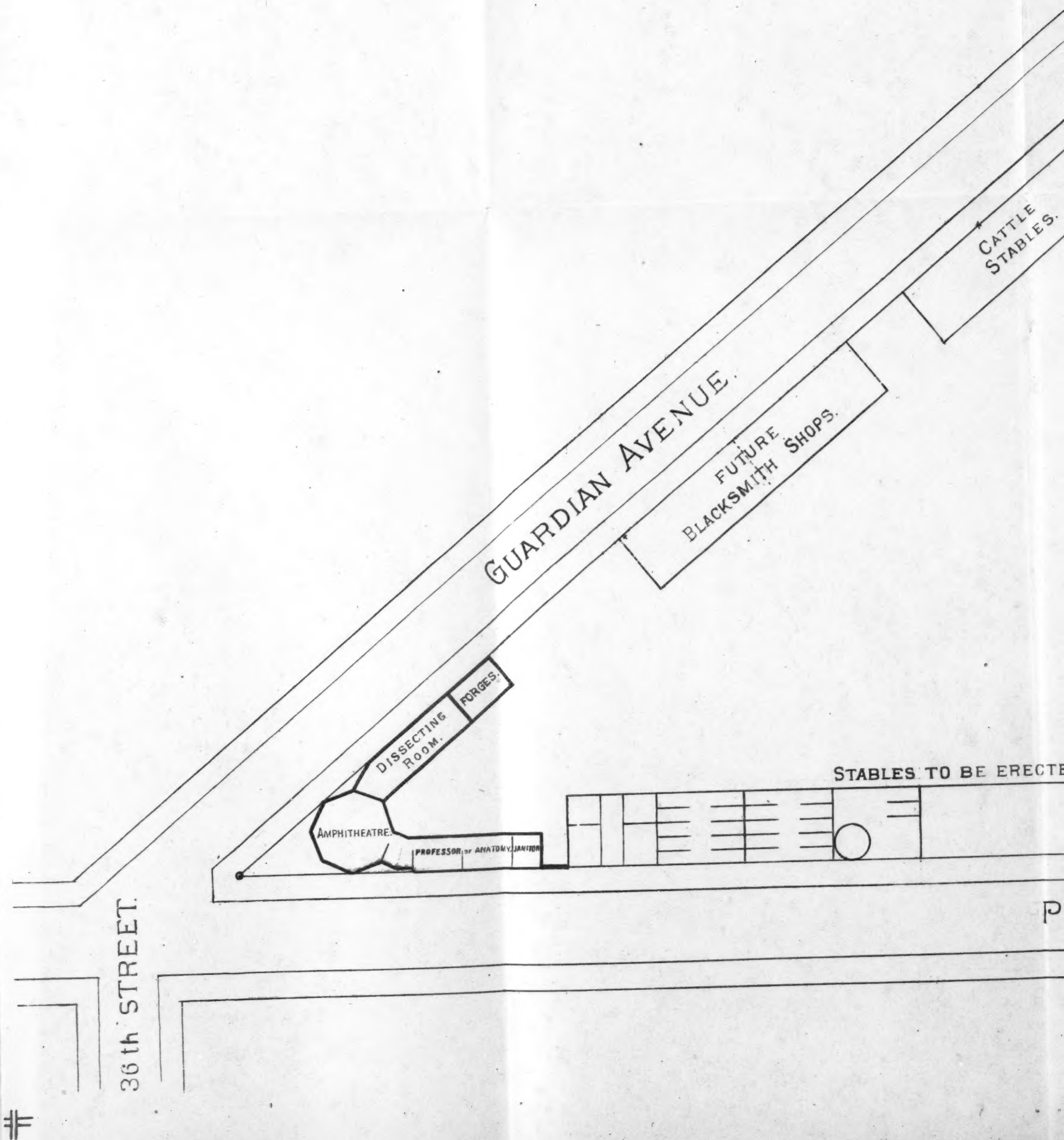
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BUILDINGS OF THE VETERINARY DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA, PHILA.

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